

# DETERMINANTS OF CULTURE THAT STIMULATE INNOVATION: STUDY IN TEXTILE INDUSTRY OF ITAJAÍ VALLEY – SC

## *DETERMINANTES DA CULTURA QUE ESTIMULAM A INOVAÇÃO: ESTUDO NA INDÚSTRIA TÊXTIL DO VALE DO ITAJAÍ – SC*

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### ABSTRACT

This study aims to “identify the presence of the determinants of innovation culture (strategy, structure, support mechanisms, behaviors that foster innovation and communication), suggested by Martins and Terblanche (2003), in the textile industry on Itajaí Valley - SC.” The research is characterized as descriptive, quantitative and survey, and was to sample 287 respondents. The data were examined using descriptive analysis, confirmatory factor analysis and structural equation modeling. It was found that there is the presence of the determinants of innovation culture in the companies studied, and behaviors that encouraged innovation dimension with greater insight. The surveyed textile organizations have flexible and open culture that encourages creativity and innovation in the workplace. The research is justified by the lack of studies on the topic, especially in industrial organizations and may be useful to professional management and textile sector so that they can relate the results to your organization.

**Keywords:** Organizational Culture. Innovation Culture. Determinants. Textile industry.

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## RESUMO

*Este estudo tem como objetivo “Identificar a presença dos determinantes da cultura de inovação Estratégia, Estrutura, Mecanismos de suporte, Comportamentos que estimulam a inovação, e Comunicação, sugeridos por Martins e Terblanche (2003), na indústria têxtil do Vale do Itajaí - SC”. A pesquisa caracteriza-se como descritiva, quantitativa e de levantamento, e teve como amostra 287 respondentes. Os dados foram examinados por meio de análise descritiva, análise fatorial confirmatória e modelagem de equações estruturais. Constatou-se que existe a presença dos determinantes da cultura de inovação nas empresas estudadas, sendo Comportamentos que Incentivam a Inovação a dimensão com maior percepção. As organizações têxteis pesquisadas têm cultura flexível e aberta, que incentiva a criatividade e a inovação no ambiente de trabalho. A pesquisa justifica-se pela carência de trabalhos referentes ao tema, principalmente em organizações industriais, podendo ser útil aos profissionais da administração e do setor têxtil, para que possam relacionar os resultados com sua organização.*

**Palavras-chave:** Cultura Organizacional. Cultura de Inovação. Determinantes. Indústria Têxtil.

## 1 INTRODUCTION

The textile and clothing sector in Brazil is known in the world industrial segment and its growth is due to the industry's ability to innovate its products using advanced and flexible processes, highlighting the organizational structure and business practices in the competition between companies (Euralex, 2004).

According to Silva Filho and Queiroz (2011), in Brazil, the sector faces competition from Asian countries such as China and Vietnam and thus, textile companies have made changes in their organizational structure, forms of organization of production and work, as well as technological innovation processes. However, Costa and Rocha (2009) argue that attempts to innovate in the Brazilian textile chain are based on the purchase of machinery and equipment, which weakens the competitive strategy chosen by giving space to imported products. The Itajaí Valley, in Santa Catarina, hosts one of the most important textile and clothing agglomerates in Brazil, with more than 3,000 companies, including small, medium and large, which generate more than 112,000 direct jobs, representing 12.2% of direct jobs in the Brazilian textile chain and 68.4% in the state of Santa Catarina (Sintex, 2015).

According to Tushman and O'Reilly (1997) and Martins and Terblanche (2003), innovation is the basis for economic growth and can be a source of sustainable competitive advantage for companies, and is critical for organizations that want to keep up in the market. It is implicit in the literature that one of the factors that can stimulate the propensity to innovate is organizational culture.

Organizational culture integrates unconscious basic values, beliefs, and assumptions that are shared by members of an organization and expressed through norms that can be observed in rituals, words, and deeds (Schein, 2004). Innovation, on the other hand, encompasses the process of creating or transforming something that can occur in products, services, production methods, opening to new markets, sources of supply and ways of organizing. It is the proper implementation of creative ideas within an organization that can generate benefits for the individual, the organization, and society (Amabile; Grykiewicz, 1989).

The organizational culture that facilitates the development of innovative processes is known as the innovation culture. Thus, due to the growing importance of innovation in business contexts and the search for differentiated competitive advantages. An organizational culture that facilitates the development of innovations becomes a strategic factor for the company to reach its objectives (Jamrog; Overholt, 2004).

Empirical studies on the culture of innovation can be represented by works by Knox (2002), Martins and Terblanche (2003), Jamrog and Overholt (2004), Hartmann (2006), Naranjo-Valencia et al. (2012), Hogan and Coote (2014) among others. In the Brazilian context, studies on the subject can be represented by the works of Gomes (2013), Morschel et al. (2013), Machado et al. (2014), Padilha and Gomes (2016) and Gomes et al. (2017) demonstrating the attention that has been given to the relationship between organizational culture and innovation.

In this work, it was used as a basis for the Culture of Innovation construct the study by Martins and Terblanche (2003), that is related to the use of organizational culture analysis from the perspective of the culture of innovation determinants, which encompasses strategy, structure, support mechanisms, behaviors that stimulate innovation and communication.

The sector's industries need to constantly innovate to stay in the market, as under pressure from other countries, such as Asia, favorable innovation performance can be crucial for companies to remain competitive. Given the above, the research question is: What are the determinants of the culture of innovation perceived by the organizational actors in the textile industry of Itajaí Valley - SC? The research aims to identify the presence of the determinants of innovation culture (strategy, structure, support mechanisms, behaviors that stimulate innovation and communication) suggested by Martins and Terblanche (2003) in the textile industry of Itajaí Valley - SC.

## 2 INNOVATION CULTURE

Organizational culture can be defined as the system of meanings understood by a given group at a given moment (Trice; Beyer, 1984). Schein (1984) defines culture as the basic assumptions developed by a group of people who have been together long enough to have shared significant problems, who had opportunities to solve these problems and to observe the effects of their solutions. This group's culture is passed on to new members as the right way to perceive, think and feel about these tribulations.

Kotter and Heskett (1994) report that organizations with defined cultures find it easier to develop with excellence, since their values are embedded in all hierarchical levels. New employees find it difficult to adopt institutional values and norms, as these values are seen as characteristics and become known not only to organizational actors but to people who do not work in the organization.

Considering concepts and characteristics of organizational culture, it is perceived that it influences innovation, since it can stimulate innovative behavior among employees, leading them to accept innovation as a basic value of the organization, making a commitment to it (Naranjo-Valencia et al., 2010). Thus, when an organization can establish a certain organizational culture, it can have better results in innovation processes. Thus, this improvement is conditioned by its culture (Dobni, 2008). That said it can be seen that innovation can be understood as something that comes from behaviors and actions that occur within an organizational culture.

The culture of innovation, in turn, involves behaviors such as creativity, risk taking, freedom, teamwork, communication, trust and respect, quick decision making. The culture of innovation is made up of four dimensions: (a) the intention to be innovative; (b) the structure to support innovation; (c) employee influence or knowledge and guidance and actions required for innovation; and (d) an environment that supports the implementation of innovation (Dobni, 2008).

In this sense, Dombrowski et al. (2007) point out eight elements of innovative organizational culture, such as: (a) mission statements and innovative vision, (b) culture of democrat-

ic communication, (c) forms of safe and innovative environments that allow for the process of covert innovation, (d) flexibility, (e) collaboration across multiple organizational boundaries - changes in organizational structures to improve the expansion of organizational boundaries will be inevitable, and these changes will transform innovative cultures into something new, with significant implications for managers -, (f) sharing and teaching among and across business units as an effective way to foster collaborative innovation, (g) team-based incentive systems to foster the culture of innovation and (h) leadership that is needed to encourage innovation.

Cornejo and Muñoz (2010) argue that, to be innovative, organizations need to create favorable conditions that stimulate innovation, considering their culture and technologies used, and then establish their own model of innovation culture. Next, the model used in this study will be presented, with the objective of describing the culture of innovation in the researched organizations.

## **2.1 Model used to describe culture of innovation: Culture Assessment Instrument (CAI)**

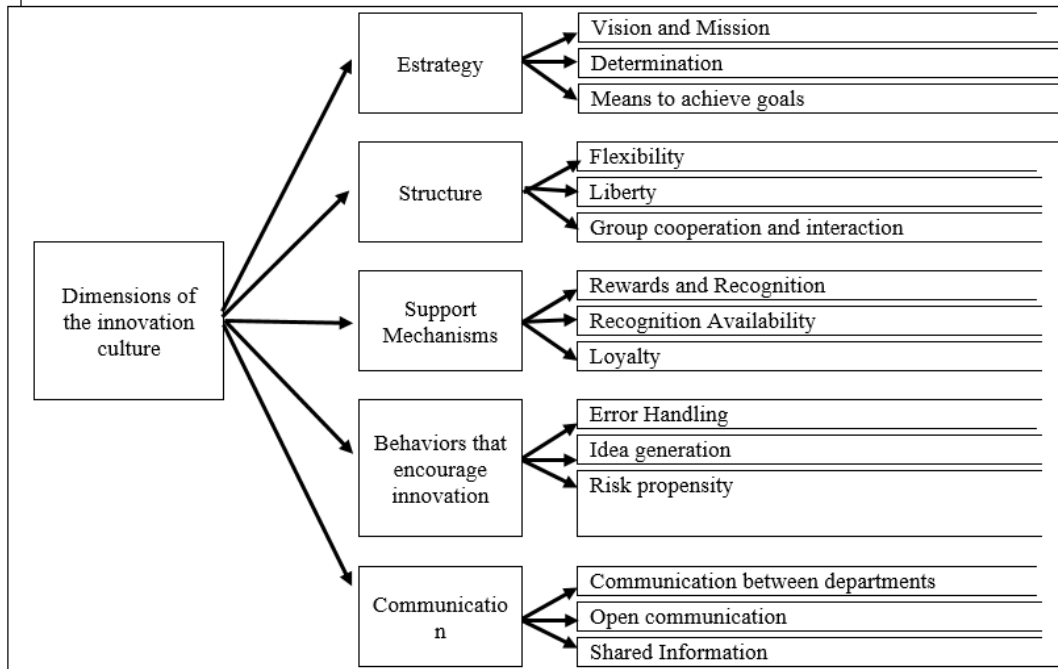
Martins (1989 and 1997) developed a model that considers the cultural norms and values that can influence the innovation process. Subsequently, Martins and Terblanche (2003) and Martins et al. (2004) studied the determinants of organizational culture that influence innovation. They found that an organization's culture and the actions of organizational actors are contributing factors for innovation to happen. Innovation occurs by implanting the new, solving a problem or improving an existing one, as long as it is relevant to those involved in the process (Martins, 2000).

The model is called the Culture Assessment Instrument (CAI), and is based on the open systems theory originally developed by Ludwig Von Bertalanffy in 1950. Studies by Martins and Terblanche (2003), Martins et al. (2004), Zdunczyk and Blenkinsopp (2007) and Sagiv and Schwartz (2007) situate organizational culture in the context of open systems theory, developed by Ludwig Von Bertalanffy (1950) and adapted by authors such as Katz and Kahn (1966).

The model, which consists of three essential elements for determining workplace behavior: (1) organizational system (goals and values, structure, management, technology and psychosociology); (2) survival functions, divided into external environment (social, industrial and business culture) and internal systems (artifacts, values and basic assumptions); and (3) culture dimensions. For Martins and Terblanche (2003), these dimensions include: vision and mission, external environment, means to achieve objectives, organizational image, management processes, employees' needs and objectives, interpersonal relationships and leadership.

Martins (1997), Martins and Terblanche (2003) and Martins et al. (2004) provides an initial insight to improve understanding of the variables that influence culture dimensions. The model proposed by the above authors can be divided into five determinants of innovation culture: strategy, structure, support mechanisms, behaviors that encourage innovation and communication. Based on these determinants, the 15 variables to be measured were developed. Figure 1 shows the innovation culture variables analyzed in this study.

Figure 1 - Innovation culture variables analyzed in this study



Source: Adapted from Gomes (2013, p. 107).

The model, represented by Figure 1, encompasses the aspects of an organization over which organizational culture can have influence. It can be used to describe organizational culture, and thus be used to identify which determinants of organizational culture influence creativity and innovation in organizations (Martins; Terblanche, 2003). Then, the five determinants of organizational culture are presented: strategy, structure, support mechanisms, behaviors that stimulate innovation and communication.

**Strategy:** Ahmed (1998) suggests that mission and vision, when well defined, influence the creation of a strong culture, guiding the behaviors and actions of organizational actors. Clear principles facilitate the understanding of those involved in the organization by moving them in the same direction (Ouchi, 1983). Organizational objectives and goals manifest the values of the organization and may encourage or hinder innovation (Arad et al., 1997).

**Structure:** Different groups act in different ways, hindering the development of innovation (TROT, 2012). According to Damanpour (1996), the size of an organization is one of the factors that influence its structure and innovation process. Pettigrew (1979) argues that bureaucracy changes according to the size of the organization, arguing that the larger the size of the organization, the greater the bureaucracy. Damanpour's (1991) meta-analysis results suggest the existence of a positive association between organizational size and innovation performance. Saraiva et al. (2005) argue that the flexibility of the textile industry can be perceived in the workforce, which is multi-qualified, and with the purpose of performing various tasks within the organization due to the variation in demand. Flexibility is also seen in production (Piccinini et al., 2006).

**Support mechanisms:** Support mechanisms must compose the culture of an organization to create an environment that can stimulate creativity and innovation (Martins; Terblanche, 2003). Rewards and recognition, as well as information and creativity, are mechanisms that perform this function, as reward for a certain behavior or attitude reinforces an organization's values (Arad et al., 1997). The organizational culture that fosters creativity and innovation must allow time flexibility so that employees can be inspired and creativity

can surface. Information technology is also an important resource for successful innovation (Shattow, 1996). The values and beliefs of managers are reflected in the type of people who are hired. Therefore, employee recruitment, selection and retention are ways to foster a culture focused on innovation. In addition to personality characteristics, such as intelligence, knowledge, risk-taking, curiosity and energy, diversity in the formation of work groups is important in hiring creative and innovative people (Martins; Terblanche, 2003). Information technology, as a support mechanism, is a resource used for the favorable performance of innovation. In organizations where technologies such as Internet and Intranet are used for communication and exchange of ideas, there are better conditions for the emergence of creativity and innovation (Martins; Terblanche, 2003).

**Behaviors that stimulate innovation:** values and norms that encourage innovation are manifested in specific behavior, and can both promote and inhibit creativity and innovation (Martins; Terblanche, 2003). Fault tolerance is essential in developing an organizational culture that aims to foster creativity and innovation. Successful organizations have a habit of rewarding success and recognizing and celebrating failure (Tushman; O'reilly, 1997). Taking risks and seeking new experiences are actions associated with creativity and innovation. In an organizational culture, where employees are encouraged to generate new ideas without being harmed, there is an incentive for creativity and innovation (Filipczak, 1997). Arad et al. (1997) indicate that the organizational culture that provides constant learning can also encourage creativity and innovation. In this way, employees feel surrounded by an atmosphere of responsibility for the favorable performance of the organization's enterprise, supported by multidisciplinary teams that provide a sense of support to members as they can share their work and share their ideas with other participants (Dougherty, 2004).

**Communication:** The organizational culture that presents transparent communication based on trust has a positive influence on the development of creativity and innovation (BARRET, 1997). By feeling confident and emotionally secure in the organization, the employee is able to diverge on some points, allowing creative and innovative new possibilities to be considered. This occurs when there is trust in those involved, enabling open communication (Martins; Terblanche, 2003). According to Schein (1993), the creation of communication routines between groups or different hierarchical levels suppresses bureaucratic processes, allowing a high stage of consistency and creativity, as individuals make up a common thought process, and become accustomed to it the difficulties and goals of the company as a whole. Knowledge acquisition through dialogue starts at high hierarchical levels and demonstrates the tendency for more agile dissemination. Employees act creatively and innovatively when they feel emotionally secure. As such, they must be able to trust each other, which in turn are provided by open communication. Proper communication includes open dialogue between individuals, teams and departments (Filipczak, 1997; Frohman; PASCARELLA, 1990). According to Naranjo-Valencia et al. (2010), organizational culture is fundamental to innovation, being one of the factors that can influence innovative behavior among members of the organization, both for encouragement and inhibition.

### 3 RESEARCH METHODS

As for the approach, this research is quantitative. Regarding the objectives, a descriptive and causal cross-sectional research was used. As for the procedures, the research is characterized as a survey.



### 3.1 Sector Contextualization

Brazil's textile and clothing sector is recognized on the world stage for its professionalism, creativity and technology, and for the size of its manufacturing park, as it is considered the sixth largest textile industry in the world. It is also the second largest producer of denim (raw material for the manufacture of jeans) and the third in knitwear production (ABIT, 2014). In 2010, the textile sector accounted for 5.5% of the net revenue of the Brazilian manufacturing industry. In terms of employed persons, their participation increased to 16.4% of the total jobs of the national manufacturing industry, according to estimates by the Institute of Study and Industrial Marketing (IEMI) for that year (ABIT, 2014). Itajaí Valley, in 2010, had a population of 807,961 inhabitants, divided into 39 cities. The most populous city was Blumenau, the main city of Itajaí Valley, with 309,011 inhabitants. In 2009, the economic movement of the Itajaí Valley, according to the composition of GDP, was approximately R\$ 16.9 billion, equivalent to 13% of state GDP (IBGE, 2014).

In the business scenario, according to the Ministry of Labor and Employment in 2011, the Itajaí Valley region had a total of 56,897 companies, which generated 298,318 formal jobs in the same year. Blumenau accounted for 42% of companies in the region, Rio do Sul for 9% and Gaspar for 7%. These three cities generated 61% of the region's formal jobs (IBGE, 2014). In the manufacturing industries, Itajaí Valley in 2011 accounted for 134,296 formal jobs, equivalent to 45% of the region's jobs (IBGE, 2014). In 2012, the region had 9,895 individual microentrepreneurs, representing an increase of 277% over 2010 (Sebrae, 2013).

Participants in this study were respondents from small, medium and large companies, according to SEBRAE (2014) criteria, totaling eight organizations and 287 respondents. Hair Jr. et al. (2005) comments that for each indicator (question to be answered) at least five respondents are needed, so the sample contemplates this suggestion, and the research instrument is composed of 26 questions. It was also observed that for the accomplishment of the SEM, it is necessary at least 100 respondents (Maroco, 2010). The companies surveyed were chosen because they are from the textile sector and this is in an unfavorable economic moment due to competition, mainly from Asian countries. They were also selected for accessibility by the researcher. Participants from small, medium and large companies participated in this study, according to SEBRAE (2014) criteria, totaling eight organizations and 287 respondents, and the respondents that make up the sample of each population (organization) were chosen from at random. The total number of respondents from small and medium size companies was lower than that of large companies. Thus, the companies were divided into two groups: one made up of small and medium enterprises and another formed by large companies. This division was carried out so that it was possible to verify whether the influence of innovation culture on product and process innovation performance differs in different company sizes. Sample distribution, company classification, population and sample can be observed in Table 1.

Table 1 - Population and sample

Organization	Population	Sample	Size	Localization	Grup
A	54	28	Small	Brusque	Small and Medium 123
B	410	26	Medium	Brusque	
C	295	63	Medium	Blumenau	
D	175	6	Medium	Blumenau	
E	680	29	Large	Blumenau	Large 164
F	1.100	7	Large	Blumenau	
G	1.050	76	Large	Brusque	
H	630	52	Large	Brusque	

Source: Research Data.

Next, the instrument used for data collection in this study will be described.

### 3.2 Data Collection Instrument

The data collection instrument contains the questions concerning the determinants of the innovation culture and was divided into five groups: strategy, structure, support mechanisms, behaviors that encourage innovation and communication. The use of this instrument ought to verify in the industry the presence of the determinants of the innovation culture, present in the literature and proposed by Martins and Terblanche (2003).

For innovation culture, questions adapted from the theoretical model of Martins and Terblanche (2003) and questions formulated based on the studies by Nkosi and Roodt (2004) and Zdunczyk and Blenkinsopp (2007) were used. Later, Gomes (2013) used the model of the above authors, applying it in the textile industry of Santa Catarina. The questionnaire was validated by Gomes (2013), in the Brazilian context, according to the following steps: (1) translation, (2) semantic validation and (3) empirical validation. The sequence followed, as suggested by Oliveira and Gomide Júnior (2009), in which the authors adapted and validated an instrument for diagnosing organizational culture for the Brazilian context. A seven-point Likert scale was used, ranging from 1 ("Strongly Disagree") to 7 ("Strongly Agree").

The data collection procedure was initiated through a previous meeting with the managers of the textile organizations selected for the research. After this contact it was possible to schedule the dates for the data collection. The questionnaires were personally delivered to the manager or sector manager by the researcher. Participants were informed that the data obtained would be treated and analyzed in strict confidence and that the results would only be presented in aggregate, without identifying the organizations or respondents. Additionally, and in order to get the most answers, it was stated that organizations that looked like the survey would eventually receive a general report on the study.

The data collection instrument was printed and made available to organizations, and the number of questionnaires varied according to the number of respondents per company. In order to obtain representativeness in the sample, the managers of each organization were asked to answer the questionnaire by as many people as possible. It was up to the organization to define the people who participated in the survey, only a sample of all organizational levels was requested. The deadline for returning the questionnaires was 20 days, however, this period was extended in order to have a larger sample. Data collection took place from June to August 2014. Following will be described the procedures for data analysis adopted in this research.

## 4 PROCEDURES FOR RESULTS ANALYSIS

First, the descriptive analysis of the data was performed verifying their dispersion through symmetry and kurtosis. Data reliability was verified by Cronbach's Alpha, Average Variance Extracted (AVE) and Composite Reliability (CR) tests. Cronbach's Alpha (CA) analysis was used to verify the reliability of the data collection instrument, seeking indexes above 0.60, as recommended by Hair Jr. et al. (2005).

Hair Jr. et al. (2005) point out limitations in Cronbach's Alpha coefficient, as the reliability calculation through it does not consider errors in the indicators. For this, we use Composite Reliability (CR) and Average Variance Extracted (AVE). CR is used to measure the internal consistency of the items. Values greater than 0.70 are suggested. Stroke, on the other hand, represents a reliability measure that indicates the general amount of variance in the indicators, explained



by the latent construct. Recommended values are greater than 0.5 for a construct (Hair Jr. et al., 2005).

For data analysis, Structural Equation Modeling (SEM) was used to verify the causality between the constructs. This technique assists in the analysis of the causal relationships between innovation culture and product innovation performance constructs. SEM is a generalized modeling technique used to test the validity of theoretical models that define causal relationships between variables. Such relationships are represented by parameters that indicate the magnitude of the effect that independent variables have on dependent variables (Maroco, 2010).

Adjustment quality indices are used to evaluate the results from three perspectives: global adjustment, adjustment compared to a basic model, and parsimony of the model (HAIR Jr. et al., 2005). For data treatment, the SPSS® (Statistical Package for Social Sciences) version 22 and AMOS® version 20 programs were used.

#### 4.1 Presentation and analysis of results

Confirmatory Factor Analysis (CFA) was performed to confirm whether the variables used can represent the model. First the indexes were calculated for the individual dimensions, and later for the model used. The second order construct called Culture of Innovation was obtained through five dimensions, namely: strategy, structure, support mechanism, behaviors that stimulate innovation and communication. When analyzing the indicators of these dimensions through the path diagram, it was noticed that the variables are statistically significant, as they presented standardized coefficients higher than 0.6, as suggested by Hair Jr. et al. (2005).

Observing the modification indices indicated by the statistical software AMOS® version 20, correlation inclusions between some variables were tested. Thus, for the Strategy dimension, a covariance was inserted between the Strat1 and Strat2 variables, as they deal with the company's mission and vision, which according to Dombrowski et al. (2007) are elements evaluated together in the innovative organizational culture. Table 2 shows the adjustment indices of the Culture of Innovation construct variables.

Table 2 - Adjustment indices of the Innovation Culture construct measurement model

Measures of Adjustment	Suggested Level	Strategy	Structure	Support Mechanisms	Behaviors that stimulate innovation	Communication
GL	-	13	5	5	5	2
$\chi^2$ e p	- (p<0,000)	36,206 (p<0,000)	6,237 - (p=0,284)	16,703 - (p=0,005)	7,462 - (p<0,000)	8,394 - (p=0,015)
$\chi^2$ /GL	≤ 5	2,785	1,247	3,341	1,492	4,197
GFI	> 0,90	0,965	0,991	0,977	0,990	0,985
AGFI	> 0,90	0,926	0,974	0,932	0,969	0,926
SRMR	< 0,10	0,081	0,060	0,082	0,044	0,053
RMSEA	0,05 a 0,08	0,078	0,029	0,090	0,041	0,105
TLI	> 0,90	0,957	0,993	0,962	0,992	0,963
CFI	> 0,90	0,973	0,996	0,981	0,996	0,988
PNFI	>0 e <1	0,594	0,491	0,487	0,494	0,328
AC	> 0,70	0,87	0,78	0,86	0,87	0,86
CC	> 0,70	0,86	0,78	0,86	0,87	0,86
AVE	> 0,50	0,47	0,42	0,56	0,57	0,61

Source: Research data.

Table 2 shows that, regarding model adjustment, 2 / GL presented indices of less than 5 for all dimensions. Adjustment quality indices (GFI) and adjusted adjustment quality index (AGFI) received values greater than 0.90, as suggested by Hair Jr. et al. (2005).

The values found for the Standardized Root Mean-Square Residual (SRMR) indicators were below 0.10, as indicated by the literature. For the Root Mean Square Error of Approximation (RMSEA) indicator, three variables presented values outside the range 0.05 to 0.08, recommended by Hair Jr. et al. (2005), whose values were: Strategy, 0.078 Structure, 0.029; Support Mechanisms, 0.090; Behaviors that Stimulate Innovation, 0.041 and Communication, 0.105.

The Tucker-Lewis Index (TLI) was above the recommended value of 0.9 for all dimensions except the Strategy. The same occurred with the values found for the comparative adjustment indices (CFI), which for the Strategy dimension was 0.893, and the others above 0.9, and thus, out of what was suggested by Hair Jr. et al. (2005).

The values found for Cronbach's Alpha (AC) were greater than 0.7, as recommended by Hair Jr. et al. (2005). For composite reliability (CR), the values obtained were greater than 0.70 and for mean extracted variance (AVE), results close to 0.50 for the dimensions, as suggested by the literature.

After evaluating the indicators separately, the whole innovation culture model was verified, as shown in Table 2. The adjustment indices obtained for the complete innovation culture model remained within the literature. Only GFI and AGFI were outside the suggested level, however the values were close to the indicated.

#### 4.2 Determinants of the culture of innovation in the textile industry

To answer the objective of this study "Identify the presence of the determinants of the culture of innovation (strategy, structure, support mechanisms, behaviors that stimulate innovation, and communication) suggested by Martins and Terblanche (2003) in the Itajaí Valley textile industry - SC" were initially analyzed the adjustment indices of the final Innovation Culture model. These can be observed through Table 3.

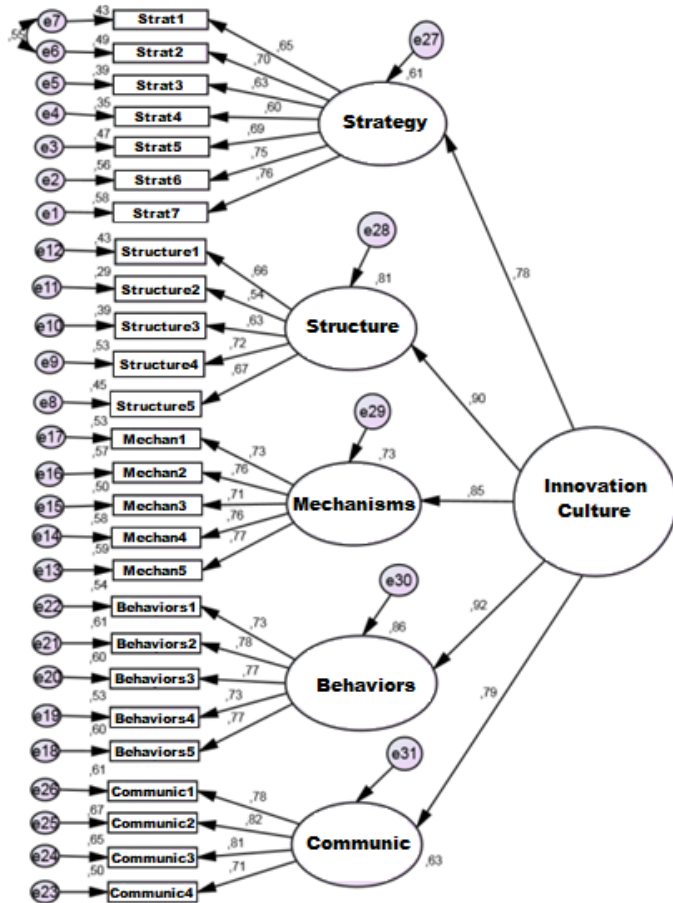
Table 3- Final Model Adjustment Indices Innovation Culture

Adjustment Measures	Suggested Level	Model Indexes
GL	-	293
$\chi^2$ e p	-(p<0,000)	660,643 (p<0,000)
$\chi^2$ /GL	≤ 5	2,255
GFI	> 0,90	0,848
AGFI	> 0,90	0,819
SRMR	< 0,10	0,056
RMSEA	0,05 a 0,08	0,066
TLI	> 0,90	0,900
CFI	> 0,90	0,910
PNFI	> 0 e < 1, near 1	0,766

Source: Research Data.

According to the results shown in Table 3, for the adequacy measures of confirmatory analyzes of the final Innovation Culture model, it was found that GFI and AGFI did not reach the minimum value (> 0.9) recommended by Hair Jr. et al. (2005). However their values were close, being 0.848 and 0.819, respectively. The other indicators were significant and had their values within the literature. Figure 2 shows the Culture of Innovation construct model.

Figure 2 - Presence of the determinants of the innovation culture



Source: Research Data.

According to Figure 2, the dimension most perceived by respondents of the surveyed textile industries was Behaviors that Stimulate Innovation, with a standardized coefficient of  $\lambda = 0.92$  and  $R^2$  of 0.86, which gives a good explanation of variance by independent variables. An organization that has a culture that constantly encourages learning and encourages its employees to develop new ideas is more likely to innovate (Martins; Terblanche, 2003).

Ahmed (1998) reports that in the face of innovative ideas, employees must know the risks they may face, and how they can act safely. In the textile industry there is a constant development of qualification and training programs for labor (Costa; Rocha, 2009). However, when mistakes occur, managers' tolerance towards them, as well as rewards, leads to a discussion of attitudes and actions performed in the organization (Tushman; O'reilly, 1997). Open leaders stimulate innovation through motivation and flexibility (Cornejo; Munoz, 2010). In Santa Catarina, the textile industry has its creativity encouraged through events related to fashion (Gomes, 2013).

The Structure dimension obtained a standardized coefficient of 0.9, and  $R^2$  of 0.81. Organizational structures composed of open environment, flexibility and incentive to creativity can be conducive to innovation (Naranjo-Valencia et al., 2012; Santos, 2008). In the textile sector, production flexibility is used in labor to make the company competitive (Piccinicci et al., 2006).

The third dimension most perceived by respondents was Support Mechanisms, with a standardized coefficient of 0.85 and  $R^2$  of 0.73. According to Gomes et al. (2014), Support Mechanisms can assist the organization in creating an environment capable of promoting innova-

tion, although the textile industry is considered low technology (Costa; Rocha, 2009). According to Rech (2006), an important factor for the gain of competitiveness in textile companies is the qualification and training of human resources. Rewards, recognition, information technology and training are fundamental factors for the development of innovation (Martins; Terblanche, 2003), as well as the formation of work teams, observing individual characteristics to form a diverse group (Breshnahan; Malerba, 1997).

The Communication dimension presented a standardized coefficient of 0.79, and an explanation coefficient (R<sup>2</sup>) of 0.63, that is, 63% of the variance is explained by its independent variables. Barrier-free communication and decentralized power (Dombrowski et al., 2007), along with trust and confidence for employees are critical to the organization's innovation (Filipczak, 1997).

The dimension with the lowest perception among employees was Strategy with standardized load of 0.78 and R<sup>2</sup> of 0.61. By all accounts employees are failing to identify that the organization's mission and vision are focused on the future. This result is in line with the results found by Gomes (2013), when this was also the dimension with the least perception among employees. Organizations with well-defined mission and vision are likely to have a strong culture (Ahmed, 1998). When mission and vision are absorbed by employees, there is a standardization of attitudes to be taken and a goal to be achieved, facilitating actions both in daily life and in times of organizational crisis (Dombrowski et al., 2007).

## 5 CONCLUSION

This study aimed to "Identify the presence of the determinants of innovation culture (strategy, structure, support mechanisms, behaviors that stimulate innovation, and communication) suggested by Martins and Terblanche (2003) in the textile industry of Itajaí Valley - SC. " It was found that there is the presence of the determinants of the culture of innovation in the companies studied, and Behaviors that Encourage Innovation the dimension with greater perception. Thus, it was noted that the researched textile organizations have a flexible and open culture, and that encourages creativity and innovation in the workplace.

The Structure dimension was the second most perceived, and it can be concluded that flexible working arrangements, commitment, teamwork and adoption of multifunctional groups are existing practices in the textile sector. Support Mechanisms were also noted by employees, and it was found that rewards, recognition and access to information are actions taken by the industry.

The two least perceived dimensions were Strategy and Communication, which implies that employees have no clear understanding of the company's vision, mission and goals, as well as effective communication between departments and employees is not noticed by respondents.

Through the results presented aims to contribute to the academic area, to have more studies on the subject and to be able to make comparisons between types of companies. Research can also be helpful to business and textile professionals so they can relate the results of this study to their organization, and for auditing purposes to evaluate the company.

Although there is scientific and methodological rigor, the study has limitations. The first limitation is that the researched population was chosen for accessibility and convenience. The companies surveyed are not from the same industry, but all belong to the textile chain.

Regarding the methodological limitations, there is the use of quantitative approach, as some authors suggest the qualitative approach to the theme. Regarding the theoretical limita-

tions, there was a lack in studies related to organizational culture and innovation, especially with regard to the conceptualization of innovation culture, its influence on innovative performance, as well as studies related to the theme conducted in the textile sector.

As suggestions for future work, it is proposed to replicate in another type of industry or region of Brazil, so that it is possible to make comparisons between them, as well as conducting a qualitative study on the subject, to be developed with managers of organizations. It is also recommended to study the impact of organizational culture on creativity.

## REFERENCES

Ahmed, P. K. (1998). Benchmarking Innovation Best Practice. *Benchmarking for quality Management & Technology*, MCB University Press, 5 (1), 45-58.

Alegre, J., Lapiedra, R., & Chiva, R. (2006). A measurement scale for product innovation performance. *European Journal of Innovation Management*, 9 (4), 333-346.

Arad, S., Hanson, M. A., & Schneider, R. J. (1997). A framework for the study of relationships between organizational characteristics and organizational innovation. *The Journal of Creative Behavior*, 31(1), 42-58.

Barret, R. (1997). Liberating the corporate soul, *HR Focus*, 74 (4), 15-16.

Bertalanfy, L. V. (1950). An outline of general system theory. *British Journal for the Philosophy of Science*.

Breshnahan, T. F.; Malerba, F. (1997). Industrial dynamics and the evolution of firms and nation competitive capabilities in the world computer industry. *Working Papers*, 97030, Stanford University, Department of Economics.

Cooper, D. R.; Schindler, P. S. (2003). *Métodos de pesquisa em administração*. 7. ed. Porto Alegre: Bookman.

Cornejo, M. C.; Munôz, E. R. Percepción de la innovación: cultura de la innovación y capacidad innovadora. *Pensamiento Iberoamericano*, 5 (2), 121-139.

Costa, A. C. R., Rocha, E. R. P. (2009). Panorama da cadeia produtiva têxtil e de confecções e a questão da inovação. *BNDES Setorial*, Rio de Janeiro, 29, 159-202.

Creswell, J. W. (2010). *Projeto de pesquisa: métodos qualitativo, quantitativo e misto*. 3 ed. Porto Alegre: Artmed.

Damanpour, F. (1996). Organizational complexity and innovation: developing and testing multiple contingency models. *Management Science*, New Jersey, 42 (5), 693-715.

\_\_\_\_\_. (1991). Organizational innovation: a meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34 (3), 555-590.

- Dobni, C. B. (2008). Measuring innovation culture in organizations. *European Journal of Innovation Management*, 11 (4).
- Dombrowski, C. et al. (2007). Elements of Innovative Cultures. *Knowledge and Process Management*, 14 (3), 190–202.
- Dougherty, D. (2004). Organizando para a inovação. In: Clegg, S. R.; Hardy, C.; Nord, W. R. *Handbook de estudos organizacionais: ação e análise organizacionais*, São Paulo: Editora Atlas.
- EURATEX. (2004). *European Technology Platform: for the future of textiles and clothing – a vision for 2020*. Brussels, Belgica: European Apparel and Textile Organization, dec.
- Filipczak, B. (1997). It takes all kinds: creativity in the workforce. *Training*, 34 (5), 32-40.
- Frohman, M., & Pascarella, P. (1990). Achieving purpose-driven innovation. *Industry Week*, 239 (19), 20-40.
- Gomes, G. (2013). *Cultura de inovação e sua influência no desempenho em inovação de produtos na indústria têxtil de Santa Catarina*. 2013, 247f. Tese (Doutorado em Ciências Contábeis e Administração) – Programa de Pós-Graduação em Ciências Contábeis e Administração da Universidade de Blumenau – FURB, Blumenau.
- Gomes, G.; Machado, D. D. P. N.; Alegre, J. (2014). Indústria têxtil de Santa Catarina e sua capacidade inovadora: estudo sob a perspectiva da eficiência, eficácia, custos e melhoria de processos. *Revista de Administração e Inovação*, São Paulo, 11 (2), 273-294.
- Gomes, G.; Torrens, E. W.; Schons, M.; Sorgetz, B. (2017). Cultura organizacional e inovação: uma perspectiva a partir do modelo de Schein. **Revista de Administração da Unimep**, 15 (1), 51-72.
- Hair Jr., J. F., Babin, B., Money, A. H., & Samouel, P. (2005). *Fundamentos e métodos de pesquisa em administração*. 6ª ed. Porto Alegre: Bookman.
- Hartmann, A. (2006). The role of organizational culture in motivating innovative behavior in construction firms. *Construction Innovation*, 6 (3), 159-72.
- Hogan, S. J.; Coote, L. V. (2014) Organizational culture, innovation, and performance: a test of Schein's model. *Journal of Business Research*, 67 (8), 1609-1621.
- Jamrog, J. J., & Overholt, M. H. (2004). Measuring HR and organizational effectiveness. *Employment Relations Today*, 31 (2), 33-45.
- Katz, D.; Kahn, R. L. (1966). *The social psychology of organization*. New York: Willey.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling*. New York: The Guilford Press.



- Knox, S. (2002). The boardroom agenda: developing the innovative organization. *Corporate Governance*, Bradford, 2 (1), 27-36.
- Kotter, J. P.; Heskett, J. L. (1994). *A cultura corporativa e o desempenho empresarial*. São Paulo: Makron Books.
- Machado, D. D. P. N. et al. (2014). Cultura de inovação: elementos da cultura que facilitam a criação de um ambiente inovador. *Revista de Administração e Inovação*, 10 (4), 164-182.
- Maroco, J. (2010). *Análise de equações estruturais: fundamentos teóricos, software & aplicações*. Report Number Lda.
- Martins, E.; Terblanche, F. (2003) Building organizational culture that stimulates creativity and Innovation. *European Journal of Innovation Management*, 6 (1), 64-74.
- Martins, E.; Martins, N., & Terblanche, F. (2004). An organizational culture model to stimulate creativity and innovation in a university library. *Advances in Library Administration and Organization*, 21 (4), 83-130.
- Martins, E.; Martins, N. An organizational culture model to promote creativity and innovation. *Journal of Industrial Psychology*, 28 (4), 58-65.
- Martins, E. C. (2000). The influence of organizational culture on creativity and innovation in a university library. Dissertation. University of South Africa: Pretoria.
- Martins, N. (1997). Elandsrand Gold-mine: organizational culture survey. Johannesburg, 1997.
- Martins, N. (1989). Organisasiekultuur in 'n finansiële instelling. 246f. Tese (Tese de Doutorado). Pretoria: University of Pretoria, 1989.
- Mintzberg, H. (1978). Mintzberg's final paradigm. *Administrative Science Quarterly*, 635-636.
- Morschel, E. L. et al. (2013). A influência da cultura organizacional no processo de inovação: o caso da Águia Sistemas de Armazenagem em Ponta Grossa, Paraná. *Revista de Administração e Inovação*, 10 (2), 219-237.
- Naranjo-Valencia, J. C., Jimenez, D. J., & Sanz-Valle, R. (2012). ¿Es la cultura organizativa un determinante de la innovación en la empresa? *Cuadernos de Economía y Dirección de la Empresa*, 15 (3), 63-72.
- Naranjo-Valencia, J. C., Sanz-Valle, R., & Jimenez, D. J. (2010). Organizational culture as determinant of product innovation. *European Journal of Innovation Management*, 13 (4), 466-480.
- Nkosi, T. J., & Roodt, G. (2004). An assessment of bias and fairness of the culture assessment instrument. *Journal of Human Resource Management*, 2 (2), 24-36.
- Oliveira, A. F.; Gomide Júnior, S. (2009). Inventário de cultura organizacional: adaptação e validação de um instrumento de diagnóstico para o contexto brasileiro. *Revista Psicologia*, 9 (2), 8-21.

Ouchi, W. (1983). *Theory Z: how american business can meet the Japanese challenge*, Addison-Wesley, Reading, MA.

Padilha, C. K.; Gomes, G. (2016). Innovation culture and performance in innovation of products and processes: a study in companies of textile industry. *RAI : Revista de Administração e Inovação*, 13, 10-25.

Piccinini, V. C., Oliveira, S. R., & Fontoura, D. S. (2006). Setor têxtil-vestuário do Rio Grande do Sul: impactos da inovação e da flexibilização do trabalho. *Ensaio FEE*, Porto Alegre, 27 (2), 355-376.

Rech, S. M. (2006). *Cadeia produtiva da moda: um modelo conceitual de análise da competitividade no elo confecção*. 2006. Tese (Doutorado em Engenharia da Produção) – Programa de Pós-Graduação em Engenharia de Produção – Universidade Federal de Santa Catarina – UFSC, Florianópolis.

Savig, L.; Schwartz, S. (2007). Cultural values in organisations: insights for Europe. *European J. International Management*, 1 (3).

Schein, E. H. (1993). How can organizations learn faster? The challenge of entering the green room. *Sloan Management Review*, 34 (2), 85-92.

Sebrae - Serviço Brasileiro de Apoio a Micro e Pequenas Empresas. (2014). Site do SEBRAE. Disponível em: <[http:// sebrae.com.br](http://sebrae.com.br)>. Acesso em: 09 Jul. 2014.

Silva Filho, L. A, & Queiroz, S. N. (2010). Indústria têxtil: avaliação empírica do emprego formal em Santa Catarina vis-à-vis o Ceará – 1998/2008. IV ENCONTRO DE ECONOMIA CATARINENSE. *Anais*. Criciúma: Unesc.

Sintex. (2014). Sindicato das Indústrias de Fiação, Tecelagem e do Vestuário de Blumenau. <[http:// www.sintex.org.br](http://www.sintex.org.br)>. Acess: 02 abr. 2014.

Trice, H. M.; Beyer, J. M. (1984). Studying Organizational Cultures through Rites and Ceremonials. *The Academy of Management Review*, 9 (4), 653-669.

Trot, P. (2012). *Gestão da inovação e desenvolvimento de novos produtos*. 4 ed. Porto Alegre: Bookman.

Tushman, M. L., & O'Reilly, C. A. (1997). *Winning through innovation: a practical guide to leading organizational change and renewal*. Harvard Business School Press, Boston, MA.

Zdunczyk, K., & Blenkinsopp, J. (2007). Do organisational factors support creativity and innovation in Polish firms? *European Journal of Innovation Management*, 10 (1), 25-40.

<b>Contribution</b>	<b>[Author 1]</b>
<b>1.</b> Definition of research problem	√
<b>2.</b> Development of hypotheses or research questions (empirical studies)	√
<b>3.</b> Development of theoretical propositions (theoretical work)	√
<b>4.</b> Theoretical foundation / Literature review	√
<b>5.</b> Definition of methodological procedures	√
<b>6.</b> Data collection	√
<b>7.</b> Statistical analysis	√
<b>8.</b> Analysis and interpretation of data	√
<b>9.</b> Critical revision of the manuscript	√
<b>10.</b> Manuscript writing	√
<b>11.</b> Other (please specify)	